Win–Win Approaches to Development and the Environment

Tropical Reforestation and Carbon Sequestration

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Center for Development Information and Evaluation

Tropical forests sequester, or store, carbon released to the atmosphere through decay, respiration, and the burning of fossil fuels. The sequestering plays an essential role in many natural systems, including climate modulation. Some developing countries are discovering they can sell this service to raise funds for reforestation and for natural forest management. Recently, USAID has worked with U.S. firms and nongovernmental organizations in testing the feasibility of funding reforestation programs in developing countries. The idea is to offset the carbon dioxide emissions of their power-generation facilities. A unique partnership between U.S. firms, environmental groups, developing-country governments, and local forest user groups has emerged from these experiences. It's a potential new approach to restoring forest cover and managing forest resources.

The Problem

Tropical forests produce many services and benefits not paid for by anyone. As a result, deforestation, particularly destruction of tropical forests in developing countries, is resulting in the loss of watersheds, wildlife habitats, and sources of timber products. Deforestation also releases carbon dioxide ($C0_2$). That contributes to the buildup of greenhouse gases, believed by many scientists to produce global warming. Most developing countries lack the financial resources to make the major investments required to halt deforestation and to restore forests on fragile lands.

The Win–Win Solution

A recent evaluation of selected USAID forestry projects suggests there are opportunities for a partnership between developing countries needing resources to finance reforestation and U.S. firms seeking to offset their emissions of carbon dioxide. (See Synthesis Report *Forestry and the Environment: An Assessment of USAID Support for Farm and Community Forestry*, September 1995). Although still too new to assess their impact, early experimental partnerships to sequester carbon dioxide by tropical reforestation warrant consideration as a promising approach to fostering both greater economic growth and a better environment.

Forests can offset industrial CO_2 emissions by sequestering carbon in forest trees and other vegetation. Because fast-growing tropical forests can fix more carbon than temperate forests, tropical reforestation projects jointly implemented by U.S. firms and developing countries can be an attractive strategy to slow global CO_2 buildup.

Domestic legislation and international agreements are now in place to encourage investments in reducing and offsetting industrial CO_2 emissions. For U.S. firms, investments in reforestation can often offset CO_2 emissions more than equivalent investments in equipment designed to reduce emissions. Moreover, resources allocated for tropical reforestation can divert demand for forest products away from natural forests and slow CO_2 buildup that would result from further natural-forest loss.

Tropical reforestation efforts provide new sources of jobs, income and investments in developing countries. Employment in tree seedling propagation, contract tree planting and management, timber harvesting and wood products milling and finishing can form the basis for sustainable economic activity. Participation of local populations and acceptance of such projects by host governments depend on the presence of economic benefits.

The Role of USAID

A few developing countries are already cooperating in reforestation and sustainable forest management for the purpose of CO_2 sequestration. In **Guatemala** a U.S. utility firm and two U.S. nongovernmental organizations launched a 40-year pioneering reforestation project for the sequestration of 18 million tons of carbon. USAID contributed a small amount of in-kind support to supplement the resources from the U.S. utility company. More recently, private U.S. utilities have begun experimental reforestation for CO_2 capture in **Malaysia, Paraguay**, and **Brazil**. Projects are currently being planned for **Thailand, Costa Rica**, and **Russia**.

USAID can provide guidance and help mobilize U.S. private resources to finance a share of tropical reforestation by promoting investments in carbon sequestration in developing countries. Specifically, USAID can work with U.S. enterprises, developing country governments and nongovernmental organizations to

1. *Reduce risks of project failure.* USAID can support environmental and rural development organizations able to provide technical and managerial skills and willing to help fund the operating costs of reforestation, particularly among local communities with limited experience in reforestation.

2. *Support independent project monitoring.* Carbon sequestration projects require periodic review of the performance of tropical reforestation efforts to assess the amount of biomass production and the benefits to participating local communities.

3. *Identify potential reforestation projects investments by U.S. enterprises.* Projects should prove profitable to U.S. investors seeking cost-effective ways to offset carbon emissions while helping developing countries achieve their own objectives.

4. *Promote local group involvement in project decisions and management.* Active participation of local groups in design and man-

agement of reforestation for carbon sequestration maximizes economic opportunities for rural populations and increases the scope for project success.

5. *Fund research on carbon sequestration technologies*. USAID can help address knowledge gaps that still exist in determining which combination of technologies and practices is best suited for carbon sequestration and forest management.

Outstanding Issues

The use of carbon sequestration programs is not without risk nor devoid of controversy. Developing countries have few resources to undertake reforestation and to manage remaining natural forests, despite growing demands for forest services and products. Technical knowledge has voids regarding biota growth, carbon-fixing cycles, land-use substitutions, and supporting details. Controversy has arisen around the perception that industrial polluters in developed countries view carbon sequestration as a means of escaping an obligation to clean up their practices at home.

Risk. There are significant risks associated with reforestation projects in developing countries. Failure of tropical reforestation projects has been high owing to political and social uncertainties, limited technical knowledge about the biology of tropical tree species, and poorly aligned costs and benefits.

Perceptions. Carbon sequestration through reforestation is not always perceived as an environmental benefit; sometimes it is seen as an escape from environmental responsibilities. Some environmental groups argue that by funding tropical reforestation, pollution-emitting industries are escaping their full commitments to reducing CO_2 emissions. Developing countries fear they will lose control over their tropical forests and become dumps for the world's $C0_2$ emissions.

Awareness. Considerable education is required to encourage U.S. firms to participate in reforestation for carbon sequestration. U.S. industries and utilities do not understand the complexities of tropical forestry or developing-country politics well enough to feel comfortable about committing resources to tropical reforestation.

Policy development. Carbon sequestration is only one of the tools that can be brought to bear on problems of deforestation and CO_2 emissions. Estimates are that 465 million hectares would need to be planted each year to offset increases in global CO_2 emissions. Other initiatives, such as the researching of cost-effective scrubbers, are required at the same time.

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